



201300103

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, there has been presented to the

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of LAW in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and Whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the LAW.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable basic seed of the variety in a public repository as provided by LAW, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety therefrom, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'PH18KW'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this eleventh day of September, in the year two thousand and fourteen.

The state of the s

Attest:

02-3

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. Include form num	nber and date on all reproductions			Form Approved - OMB No. 0581-0055			
U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE			The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.				
APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE (Instructions and Information collection burden statement on reverse) 1. NAME OF OWNER Pioneer Hi-Bred International, Inc.		Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).					
		2. TEMPO	RARY DESIGNATION OR EXPERIMENTAL NAM	PH18KW			
4. ADDRESS (Street and No., or R.F.D. No., C	monte of the control	E TELEDI	HONE (include eree code)				
	A POPULATION OF THE PROPERTY O	5. TELEPI	Committee of the Commit	FOR OFFICIAL USE ONLY PVPO NUMBER			
7100 NW 62nd Av	enue	C FAY #	(515) 535-6975				
P.O. Box 1014 Johnston, Iowa 50131-1014 USA		6. FAX (Inc	(515) 535-2125	201300103			
7. IF THE OWNER NAMED IS NOT A "PERSO GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.)	8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE O	OF INCORPORATION	FILING DATE			
Corporation	lowa		March 5, 1999	January 11, 2013			
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION Bradford D. Hall Pioneer Hi-Bred International Crop Genetics Research and PO Box 85 Johnston, Iowa 50131-0085				F FILING AND EXAMINATION FEES: \$ \$ \(\frac{382}{2013} \) R DATE 1112013 CERTIFICATION FEE: \$ DATE			
11. TELEPHONE (Include area code)	12. FAX (Include area code)		13. E-MAIL				
(515) 535-6975	(515) 535-2125		brad.hall@p	pioneer.com			
14. CROP KIND (Common Name)	16. FAMILY NAME (Botenical)		18. DOES THE VARIETY CONTAIN ANY TRAN	ISGENES? (OPTIONAL)			
Corn	Gramineae		Types No				
15. GENUS AND SPECIES NAME OF CROP	17. IS THE VARIETY A FIRST GENERAL	TION HYBRID	APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR				
Zea mays 19. CHECK APPROPRIATE BOX FOR EACH A	YES X NO		COMMERCIALIZATION. 20. DOES THE OWNER SPECIFY THAT SEED	-			
a. X Exhibit A. Origin and Breeding History of the North Exhibit B. Statement of Distinctness c. X Exhibit C. Objective Description of Veriet d. Exhibit D. Additional Description of the North Exhibit E. Statement of the Basis of the f. X Exhibit F. Declaration Regarding Depose g. X Voucher Sample (3,000 viable untreated that tissue culture will be deposited and in N. X Filing and Examination Fee (\$4,382), ma States* (Mail to the Plant Variety Protections). 33. HAS THE VARIETY (INCLUDING ANY HAR.)	oly Variety (Optional) Owner's Ownership It seeds or, for luber propagated varieties, volumental in an approved public repository) ide payable to "Treasurer of the United on Office)		CLASS OF CERTIFIED SEED? (See Section	OF THIS VARIETY BE LIMITED AS TO FION REGISTERED CERTIFIED OF THIS VARIETY BE LIMITED FOR EACH CLASS. CERTIFIED BY USE IND SPACE INDICATED ON THE REVERSE.			
FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. OTHER COUNTRIES? YES X NO			INTELLECTUAL PROPERTY RIGHT (PLAN)	T BREEDER'S RIGHT OR PATENT)?			
IF YES, YOU MUST PROVIDE THE DATE OF			IF YES, PLEASE GIVE COUNTRY, DATE OF REFERENCE NUMBER. (Please use space is	FILING OR ISSUANCE AND ASSIGNED			
The owners declare that a viable sample of may be applicable, or for a tuber propage. The undersigned owner(s) is(are) the own Section 42, and is entitled to protection upon the control of the contro	of basic seed of the veriety has been furnish ted variety a tissue culture will be deposite	hed with application a public of pageted plant of the pageted plant of t	callon and will be replenished upon request in accerepository and mainteined for the duration of the ceverlety, and believe(s) that the verlety is new, distincted in Act.	ordence with such regulations as ortificate,			
SIGNATURE OF OWNER			NATURE OF OWNER				
GIOWATURE OF OWNER		aigh	TONE OF OWNER ()	1) 1/1/			
NAME (Please print or type)		NAM	ME (Pieaso print or type)	J. FEN			
	a		Bradford D. Hall	\			
CAPACITY OR TITLE	DATE	CAP	Sr. Research Associate	12/19/2017			

GENERAL INSTRUCTIONS: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rulas of Practice). NEW: With the application for a seed reproduced variety or by direct deposit soon after filing, the applicant must provide at least 3,000 viable untreated seeds of the variety per se, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificates. Certificates will be issued to owner, not licensee or agent.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

General E-mail: PVPOmail@usda.gov

Homepage: http://www.ams.usda.gov/science/pvpo/PVPindex.htm

SPECIFIC INSTRUCTIONS:

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, Seed Regulatory and Testing Branch, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. http://www.ams.usda.gov/lsg/seed.htm.

ITEM

19a. Give:

- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
- (2) the details of subsequent stages of selection and multiplication;

(3) evidence of uniformity and stability; and

- (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
 - (1) identify these varieties and state all differences objectively;
 - (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19o. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
- 20. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of cartified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
- 23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
- 24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.
- 22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)
- 23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

RAD 2/4/2014 24. CONTINUED FROM FRONT (Please give the country, date of filing or Issuanca, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

USPTO 2/15/2012 Application No. 13/396,661

US PATENT 8598436 12/03/2013

According to the Peperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to everage 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliafs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Parsons with disabilities who require allernative means for communication of program information (Braille, large print, audictage, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To the accompletel of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and amployer.

Exhibit A: Origin and Breeding History for PH18KW

Pioneer variety PH18KW, an inbred of yellow corn (Zea mays L.), was developed by Pioneer Hi-Bred International, Inc. from a cross made in 2003 in Marion, Iowa between PHEKN (PVP Certificate No. 200700310) x PHEJW (PVP Certificate No. 200600210) using the pedigree method of plant breeding. Varieties PHEKN and PHEJW are proprietary inbred lines of Pioneer Hi-Bred International, Inc.

During line development, crosses were made to inbred testers for the purpose of estimating hybrid combining ability. Yield trials were grown at Janesville, Wisconsin and other Pioneer research locations.

The criteria used in the selection of **PH18KW** were yield per se and yield in hybrid combination. Late season plant health, grain quality, and stalk lodging resistance were important criteria considered during selection. Other selection criteria include: ability to germinate in adverse conditions, disease and insect resistance, pollen production and tassel size.

Variety PH18KW has shown uniformity and stability for 5 generations and for all traits observed as described in Exhibit C – Objective Description of Variety.

No variants have been observed or are expected in PH18KW.

Developmental History

- → The initial cross PHEKN x PHEJW was made in Marion, Iowa in 2003.
- → The F1 seed was planted at Puerto Vallarta, Mexico in 2003 and self-pollinated. The F2 seed was bulked.
- → The F2 seed was planted at Janesville, Wisconsin in 2004 and self-pollinated. The F3 ears were selected.
- → The F3 seed was planted ear-to-row at Janesville, Wisconsin in 2005 and self-pollinated. The F4 ears were selected.
- → The F4 seed was planted ear-to-row at Janesville, Wisconsin in 2006 and self-pollinated. The F5 ears were selected.
- → The F5 seed was planted ear-to-row at Puerto Vallarta, Mexico in 2006 and self-pollinated. The F6 ears were selected.
- → The F6 seed was planted ear-to-row at Janesville, Wisconsin in 2007 and self-pollinated. The F7 ears were selected.
- → The F7 seed was planted ear-to-row at Puerto Vallarta, Mexico in 2007 and self-pollinated. The F8 ears were selected.
- → The F8 seed was planted ear-to-row in Janesville, Wisconsin in 2008 and self-pollinated. The resulting F9 seed was bulked as breeder seed.

Exhibit B: Statement of Distinctness

Variety PH18KW is most similar to Pioneer Hi-Bred International, Inc. proprietary inbred line PHEJW (PVP Certificate No. 200600210). Variety PH18KW is significantly different from PHEJW in the following traits (see Tables 1 and 2).

Variety PH18KW has:

- a taller average plant height (217.8 cm for PH18KW vs 201.4 cm for PHEJW)
- less anthocyanin color development in the brace roots (faint for PH18KW vs dark for PHEJW)
- a less erect tassel branch attitude (horizontal for PH18KW vs erect for PHEJW)

Table 1: Data supporting differences between PH18KW and PHEJW. The varieties were grown in two locations having different planting dates and growing environments. A two-sample t-test was used to compare differences between means.

plant height (cm)

Year	Location	VARIETY-1	VARIETY-2	Count-1	Count-2	Mean-1	Mean-2	Diff	Stdev-1	Stdev-2	SEdiff	t-value	prob
2010	DC	PH18KW	PHEJW	18	18	214.0	199.2	14.8	6.50	8.81	2.58	5.73	0.000
2010	JH	PH18KW	PHEJW	16	17	222.1	203.8	18.3	6.75	7.55	2.50	7.32	0.000

Table 2: Data supporting differences between PH18KW and PHEJW. The varieties were grown in two locations having different planting dates and growing environments.

Variety	Brace Root Anthocyanin	Tassel Branch Attitude
PH18KW	Faint	Horizontal
PHEJW	. Dark	Erect

REPRODUCE LOCALLY. Include form number and date on all reproductions.

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The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, market status, familial status, perental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public essistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Brailie, large print, audictape, etc.) should contact USDA's TARGET Center at (202) 720-2800 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20260-9410, or cell (600)795-3272 (voice) or (202)720-6382 (TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY

Exhibit C

	PLANT VARIETY PROTECT BELTSVILLE, MD 2		
	OBJECTIVE DESCRIPTION Corn (Zea mays L		
NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL	DESIGNATION	VARIETY NAME
Pioneer Hi-Bred International, Inc.			PH18KW
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Count	מיי		TOROTHEIALUSE ONLY
7301 NW 62nd Avenue			
Johnston low	a 50131-0085 L	SA	201300103
numbers that describe the characteristics of the mo The variety that you choose for comparison should variety should be grown in field trials with the applic At least one year of trials should be conducted with from one trial on 15-25 randomly selected plants technical content last updated Dec. 1992.)	be the most similar one in term cation variety for 2-3 location/ye in the United States of America	s of overall morph ears (environments . In general, meas	ology, background and maturity. The comparison s) in the region and season of best adaptability. surements of quantitative traits should be taken
COLOR CHOICES (Use in conjunction with Munsel	Il color code to describe all colo	r choices; describ	e #25 and #26 in Comments section):
01 = Light Green 06 = Pale Yellow 02 = Medium Green 07 = Yellow 03 = Dark Green 08 = Yellow-Orang 04 = Very Dark Green 09 = Salmon 05 = Green-Yellow 10 = Pink-Orange	14 = Red	16 = Pale Purp 17 = Purple 18 = Colorless 19 = White 20 = White Cap	22 = Tan 23 = Brown 24 = Bronze
STANDARD INBRED CHOICES (Use the most sin Yellow Dent Families: Family Members B14 CM105, A632, B64, B68 B37 B37, B76, H84 B73 N192, A679, B73, NC268 C103 M017, Va102, Va35, A682 Oh43 A619, MS71, H99, Va26 Wf9 W64A, A554, A654, Pa91	nilar (in background and matur Yellow Dent (Univ Co109, ND2 Oh7, T232 W117, W153 W182BN White Dent: Cl66, H105,	elated): 46 BR	ke comparisons based on grow-out trial data): Sweet Corn: C13, lowa5125, P39, 2132 Popcorn: SG1533, 4722, HP301, HP7211 Pipecorn: Mo15W, Mo16W, Mo24W
1. TYPE: (Describe intermediate types in Commental 1 = Sweet 2 = Dent 3 = Flint 4 = Flour 5 8 = Other (specify)	= Pop 6 = Ornamental 7 = Pip		Inbred Name: B73 Type
2. REGION WHERE DEVELOPED IN THE U.S.A.: 2 1 = Northwest 2 = North central 3 = North central 5 = South central 6 = Southwest 7 =	ortheast 4 = Southeast	Standard —	Seed Source: PI 550473 Region Where Developed
Application Variety Data		Standar	d Inbred Data

Exhibit C (Corn)

Application	on Variety Data			Standard Inbred D	ata	1-1-1-1	Exhibit C (Cor
3. MATU	JRITY (In Region Best Adaptat	ollity: show Heat Unit Formula in C	omments section):				
DAY	'S HEAT UNITS			DAYS	HEAT UNITS		
54	1225.0	From emergence to 50% of pla	ants in silk	57	1318.3	50% Silk	
55	1249.0	From emergence to 50% of pla	ants in pollen	57	1303.3	50% Pollen	
2	36.3	From 10% to 90% pollen shed		3	82.0	Pollen Shed	Period
No.		From 50% silk to optimum edit	ole quality			50% Edible	
		From 50% silk to harvest at 25	% moisture			Dry Down Pe	riod
4. PLAN	T:	Standard Deviation	Sample Size	Mean	Stand	ard Deviation	Sample Siz
214.0	cm Plant Height (to tassel t	ip) <u>6.50</u>	18	237.3 _ cm Plan	nt Height	20.23	18
73.7	cm Ear Height (to base of to	op ear node) 5.75	18	88.8 cm Ear	Height	13.67_	18
17.1	cm Length of Top Ear Intere	node1.06	18	16.9 cm Inter	rnode	3.40	18
	Average Number of Tillers			No. Tille	ers		
0.9	Average Number of Ears pe	er Stalk 0.11	2*	0.9 No. Ear	s/Stalk	0.05	2*
2	Anthocyanin of Brace Roots:	1 = Absent 2 = Faint 3 = Moder	rate 4 = Dark	4_ Brace R	oot Anthocyan	in	
5. LEAF:	0	Standard Deviation	Sample Size	Mean	Standa	ard Deviation	Sample Siz
10.1	cm Width of Ear Node Leaf	1.08	18	8.4 cm Leaf	Width	0.86	18
75.2	cm Length of Ear Node Lea	2.60	18		Length	4.09	18
5.6	Number of leaves above top	p ear 0.51	18	6,1 No. Top	Leaves	0.42	18
25.0	degrees Leaf Angle (measure from 2nd leaf a	6.18 above ear at anthesis to stalk ab	18 love leaf)	Leaf Ang	gle	2.08	18
4	Leaf Color (Munsell Code)	5GY3/6		4 Leaf Col	or (Munsell C	ode)7.50	3Y3/4_
4	Leaf Sheath Pubescence (Rate on scale from 1 = non	e to 9 = like peach fuzz)		3 Leaf She	eath Pubescen	се	
	Marginal Waves (Rate on so	cale from 1 = none to 9 = many)		Marginal	Waves		
	Longitudinal Creases (Rate	on scale from 1 = none to 9 = m	nany)	Longitud	linal Creases		
. TASSE	EL:	Standard Deviation	Sample Size	Mean	Standa	ard Deviation	Sample Size
2.6	Number of Primary Lateral E	3ranches1.09_	18	6.0 No. Tass	sel Branches	0.91_	18
22.8	Branch Angle from Central S	Spike 9.89	18	Branch A	Angle	12.25	18
48.5	cm Tassel Length (From top leaf collar to tasse	3.38	18	54.6 cm Tass	el Length	5.64	16
4	Pollen Shed (Rate on Scale	from 0 = male sterile to 9 = hea	vy shed)	6 Pollen S	hed Rate		
12	Anther Color (Munsell Code)	10RP5/8		11 Anther C	olor (Munsell C	Code)10F	R7/6
3	Glume Color (Munsell Code)	5GY4/6		14 Glume Color (Munsell Code) 10RP3/8			
1	Bar Glumes (Glume Bands):	1 = Absent 2 = Present		1 Bar Glun	nes		
nnlinelle -	Variety Data	- ideasure -		Standard Inbred Dat			

Exhibit C (Corn) Application Variety Data Standard Inbred Data 7a. EAR (Unhusked Data): Silk Color (3 days after emergence) (Munsell code) 10RP3/8 Silk Color (Munsell code) 2.5GY8/6 Fresh Husk Color (25 days after 50% silking) (Munsell code) __2.5GY6/6 Fresh Husk Color (Munsell code) 2.5GY6/6 19 Dry Husk Color (65 days after 50% silking) (Munsell code) 2.5Y9/2 Dry Husk Color (Munsell code) 2.5Y9/2 2 Position of Ear at Dry Husk Stage: 1 = Upright 2 = Horizontal 3 = Pendent Ear Position Husk Tightness (Rate on scale from 1 = very loose to 9 = very tight) 7 8 Husk Tightness Husk Extension (at harvest): 1 = Short (ears exposed) 2 = Medium (<8 cm) Husk Extension 3 = Long (8-10 cm beyond ear tip) 4 = Very Long (>10 cm) 7b. EAR (Husked Ear Data): Standard Deviation Sample Size Mean Standard Deviation Sample Size 15.4 cm Ear Length 0.85 18 12.6 cm Ear Length 1.29 18 18 36.1 mm Ear Diameter at mid-point 1.45 40.3 mm Ear Diameter 2.02 18 99.7 10.48 gm Ear Weight 18 88.6 gm Ear Weight 19.77 18 13.6 Number of Kernel Rows 1.29 18 1.50 17.4 No. Kernel Rows 18 2 Kernel Rows: 1 = Indistinct 2 = Distinct 2 Kernel Rows Row Alignment: 1 = Straight 2 = Slightly Curved 3 = Spiral Row Alignment 6.1 cm Shank Length 6.2 cm Shank Length 2.05 1.37 18 18 Ear Taper: 1 = Slight 2 = Average 3 = Extreme 1 Ear Taper 8. KERNEL (Dried): Standard Deviation Sample Size Mean Standard Deviation Sample Size 10.2 mm Kernel Length 0.65 10.4 mm Kernel Length 18 0.50 18 7.7 mm Kernel Width 0.59 18 6.7 mm Kernel Width 0.57 18 4.3 mm Kernel Thickness 0.57 18 3.7 mm Kernel Thickness 0.57 18 2** 2** 35.5 % Round Kernels (Shape Grade) 2.12 12.02 16.5 % Round Kernels Aleurone Color Pattern: 1=Homozygous 2=Segregating Aleurone Color Pattern (Describe) 1 (Describe Aleurone Color (Munsell code) 10YR8/14 7 Aleurone Color (Munsell code) 10YR7/14 7 Hard Endosperm Color (Munsell code) 10YR7/14 7 Endosperm Color (Munsell code) 10YR7/12 7 Endosperm Type: 1 = Sweet (su1) 2 = Extra Sweet (sh2) 3 Endosperm Type 3 3 = Normal Starch 4 = High Amylose Starch 5 = Waxy Starch 6 = High Protein 7 = High Lysine 8 = Super Sweet (se) 9 = High Oil 10 = Other ___21.5 18.5 gm Kernel Wt. 2** gm Weight per 100 Kernels (unsized sample) 0.71 3.54 9. COB: Standard Deviation Standard Deviation Sample Size Mean Sample Size mm Cob Diameter at mid-point 1.24 18 mm Cob Diameter 1.79 18 19 Cob Color (Munsell code) 5Y9/1 10 Cob Color (Munsell code) 2.5YR4/8 Standard Inbred Data Application Variety Data

Page 5 of 7

		Exhibit C (Corn
Application Variety Data 10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant);	Standard Inbred Data	
leave blank if not tested; leave Race or Strain Options blank if polygenic):		
A. Leaf Blights, Wilts, and Local Infection Diseases		
Anthracnose Leaf Blight (Colletotrichum graminicola)	Anthracnose Leaf Blight	
Common Rust (Puccinia sorghi)	Common Rust	
Common Smut (Ustilago maydis)	Common Smut	
Eyespot (Kabatiella zeae)	Eyespot	
7 Goss's Wilt (Clavibacter michiganense spp. nebraskense)	_6_ Goss's Wilt	
4 Gray Leaf Spot (Cercospora zeae-maydis)	3 Gray Leaf Spot	
Helminthosporium Leaf Spot (Bipolaris zeicola) Race		
6 Northern Leaf Blight (Exserohilum turcicum) Race		
Southern Leaf Blight (Bipolaris maydis) Race		
Southern Rust (Puccinia polysora)	Southern Rust	
Stewart's Wilt (Erwinia stewartii) Other (Specify)	Stewart's Wilt Other (Specify)	
Other (Specify)	Other (Specify)	_
B. Systemic Diseases		
Corn Lethal Necrosis (MCMV and MDMV)	Corn Lethal Necrosis	
Head Smut (Sphacelotheca relliana)	Head Smut	
Malze Chlorotic Dwarf Virus (MCDV)	Maize Chlorotic Dwarf Virus	
Maize Chlorotic Mottle Virus (MCMV)	Maize Chlorotic Mottle Virus	
Maize Dwarf Mosaic Virus (MDMV) Strain	Maize Dwarf Mosaic Virus Strain	
Sorghum Downy Mildew of Corn (Peronosclerospora sorghi)	Sorghum Downy Mildew of Corn	
Other (Specify)	Other (Specify)	
C. Stalk Rots		
Anthracnose Stalk Rot (Colletotrichum graminicola)	Anthracnose Stalk Rot	
Diplodia Stalk Rot (Stenocarpella maydis)	Diplodia Stalk Rot	
Fusarium Stalk Rot (Fusarium moniliforme)	Fusarium Stalk Rot	
1 Gibberella Stalk Rot (Gibberella zeae)	2 Gibberella Stalk Rot	
Other (Specify)	Other (Specify)	
D. Ear and Kernel Rots	96	
Aspergillus Ear and Kernel Rot (Aspergillus flavus)	Aspergillus Ear and Kernel Rot	
	3 Diplodia Ear Rot	
8 Fusarium Ear and Kernel Rot (Fusarium moniliforme)	6 Fusarium Ear and Kernel Rot	
Gibberella Ear Rot (Gibberella zeae)	Gibberella Ear Rot	
Other (Specify)	Other (Specify)	
11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant)		
Leave blank if not tested):		
Standard Deviation Sample Size	Standard Deviation	Sample Size
Banks Grass Mite (Oligonychus pratensis)	Banks Grass Mite	
Corn Earworm (Helicoverpa zea)	Corn Earworm	
Leaf-Feeding	Leaf-Feeding	
Silk Feeding: mg larval wt	Silk Feeding:	
Ear Damage	Ear Damage	
Corn Leaf Aphid (Rhopalosiphum maidis)	Corn Leaf Aphid	
Corn Sap Beetle (Carpophilus dimidiatus)	Corn Sap Beetle	
European Corn Borer (Ostrinia nubilalis)	European Corn Borer	
1st Generation (Typically Whorl Leaf Feeding)	1st Generation	
2nd Generation (Typically Leaf Sheath-Collar Feeding)	2nd Generation	
Stalk Tunneling:	Stalk Tunneling:	
cm tunneled/plant	cm tunneled/plant	
		-
Fall Armyworm (Spodoplera frugiperda)	Fall Armyworm	
Leaf-Feeding Silk Feeding:	Leaf-Feeding Silk Feeding:	
mg larval wt.	mg larval wt.	
- Ing across the		
Application Variety Data	Standard Inbred Data	

	Exhibit C (Con			
Application Variety Data	Standard Inbred Data			
11. INSECT RESISTANCE (continued):				
Standard Deviation Sample Size	Standard Deviation Sample Size			
Maize Weevil (Sitophilus zeamaize)	Maize Weevil			
Northern Rootworm (Diabrotica barberi)	Northern Rootworm			
Southern Rootworm (Diabrotica undecimpunctata)	Southern Rootworm			
Southwestern Corn Borer (Diatraea grandiosella)	Southwestern Corn Borer			
Leaf-Feeding	Leaf-Feeding			
Stalk Tunneling: cm tunneled/plant	Stalk Tunneling			
Two-spotted Spider Mite (Tetranychus urticae)	Two-spotted Spider Mile			
Western Rootworm (Diabrotica virgifera virgifera)	Western Rootworm			
Other (Specify)	Other (Specify)			
12. AGRONOMIC TRAITS:				
Stay Green (at 65 days after anthesis) (Rate on a scale of 1 = worst to 9 = excellent)	Stay Green			
% Dropped Ears (at 65 days after anthesis)	% Dropped ears			
% Pre-anthesis Brittle Snapping	% Pre-anthesis Brittle Snapping			
% Pre-anthesis Root Lodging	% Pre-anthesis Root Lodging			
% Post-anthesis Root Lodging (at 65 days after anthesis)	% Post-anthesis Root Lodging			
Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)	Yield			
13. MOLECULAR MARKERS: (0 = data unavailable; 1 = data available but not supplied Isozymes RFLP's RAPD's1 Other (Specify)				
REFERENCES:				
Butler, D.R. 1954. A System for the Classification of Corn Inbred Lines. PhD Thesis. Of Emerson, R.A., G.W. Beadle, and A.C. Fraser. 1935. A Summary of Linkage Studies in Farr, D. F., G. F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant and Plant Prosciety. St. Paul, MN. Inglett, G. E. (Ed.) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Jugenheimer, R. W. 1976. Corn: Improvement, Seed Production, and Uses. John Wiley & McGee, D.C. 1988. Maize Diseases. APS Press. St. Paul, MN. 150 pp. Munsell Color Chart for Plant Tissues. Macbeth. P.O. Box 230, Newburgh, NY 12551-02 The Mutants of Maize. 1968. Crop Science Society of America, Madison, Wl. Shurtleff, M.C. 1980. Compendium of Corn Diseases. APS Press. St. Paul, MN. 105 pp. Sprague, G.F., and J.W. Dudley (Editors). 1988. Corn and Corn Improvement. Third Edit Madison, Wl. Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959. U. S. Department of Agriculture. 1936. 1937. Yearbook.	Maize. Cornell A.E.S., Mem. 180. bducts in the United States. The American Phytopathological Westport, CT. Sons, New York. 30.			
COMMENTS: (e.g., state how heat units were calculated, standard inbred seed source, an	d/or where data was collected. Continue in Exhibit D.)			
Sample number reflects the number of plots where the trait(s) was observed and not the nuclear trait of the process of the plots were set up.	umber of individual plants scored. Please see			
	· · · · · · · · · · · · · · · · · · ·			

Insect, disease, brittle snapping, yield and root lodging data are collected mainly from environments where variability for the trait can be obtained within the experiment.

^{**} For these plot-level traits, kernels from approximately 5 representative ears were sampled. 100 unsized kernels were counted and weighed. Up to 500 grams of kernels were sized by a 13/64 inch slot screen.



CLARIFICATION OF DATA IN EXHIBITS B AND C

Please note the data presented in Exhibit B and C, "Objective Description of Variety," are collected primarily at Johnston and/or Dallas Center, Iowa. The data in Table 1 are from two sample t-tests using data collected in Johnston and Dallas Center, IA. These traits in Exhibit B collectively show distinct differences between the two varieties.

For the given year of data collection, our experimental design was set up in a typical complete block design commonly used in agricultural corn research experiments with two replications grown at each location. The experimental procedures generally involve two locations/environments with different planting dates, planted in 17.42 ft. rows with 2 row plots (group) for each variety. Approximately 20-30 plants emerged in each of the 2 rows for a total of around 80 to 120 plants being evaluated at each location and 160 to 240 plants across locations. For plant level traits, we sampled up to 18 representative plants from each location. For plot level traits we evaluated the 2 row plot (group) and gave a representative score or average on the 80-120 plants in the group within an experiment.

GROWING DEGREE UNITS (G		EE UNITS (GDUs)	PRECIPITATION (Inches)			
	. 201	10	2010			
Month	Dallas Center	Johnston	Dallas Center	Johnston		
May	406	411	3.85	3.86		
June	662	669	14.21	13.79		
July	776	804	7.44	6.12		
August	761	788	11.78	15.91		
September	457	468	4.56	5,53		
TOTAL	3062	3140	41.84	45.21		

Growing Degree Units use following formula: GDU = ((T1+T2)/2)-50

Where T1 = minimum temperature for a given day with 50 degrees Fahrenheit as the minimum temperature used and 86 degrees Fahrenheit is the maximum temperature used.

Where T2 = maximum temperature for a given day with 86 degrees Fahrenheit as the maximum temperature used and 50 degrees Fahrenheit is the minimum temperature used.

GDUs are calculated each day and accumulated (summed) over certain number of days.

REPRODUCE LOCALLY. Include form number and date on all reproductions.		Form Approved OMB NO 0581-0055
U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE EXHIBIT E STATEMENT OF THE BASIS OF OWNERSHIP	Application is required in order to det certificate is to be issued (7 U.S.C. 24 confidential until the certificate is issued	(21). The information is held
NAME OF APPLICANT(S) Pioneer Hi-Bred International, Inc.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME PH18KW
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)	5. TELEPHONE (Include sres code)	6. FAX (Include area code)
7100 NW 62nd Avenue	(515) 535-6975	(515) 535-2125
P. O. Box 1014 Johnston, Iowa 50131-1014 USA	7. PVPO NUMBER	
8. Does the applicant own all rights to the variety? Mark an "X" in the	appropriate block. If no, please explain.	X YES NO
9. Is the applicant a U.S. national or a U.S. based entity? If no, give r	name of country.	NO
10. Is the applicant the original owner?	NO If no, please answer on	of the following:
a. If the original rights to variety were owned by individual(s), is (a YES	are) the original owner(s) a U.S. National NO If no, give name of cour	
b. If the original rights to variety were owned by a company(les),	is (are) the original owner(s) a Ú.S. base NO If no, give name of cour	
11. Additional explanation on ownership (Trace ownership from origina	I breeder to current owner. Use the reve	rse for extra space if needed):
Pioneer Hi-Bred International, Inc. (PHI), Des Moines, Iov (POC), Des Moines, Iowa, is the employer of the plant bre Hi-Bred International and/or Pioneer Overseas Corporation contracts that assign all rights in the variety to PHI and/or retained by any individuals.	eders involved in the selection and on has the sole rights and ownership of	levelopment of PH18KW. Pioneer of PH18KW pursuant to written
PLEASE NOTE:		
Plant variety protection can only be afforded to the owners (not licens	ees) who meet the following criteria:	
If the rights to the variety are owned by the original breeder, that pronational of a country which affords similar protection to nationals of	erson must be a U.S. national, national of f the U.S. for the same genus and specie	a UPOV member country, or s.
If the rights to the variety are owned by the company which employ nationals of a UPOV member country, or owned by nationals of a or genus and species.	ved the original breeder(s), the company of country which affords similar protection to	nust be U.S. based, owned by nationals of the U.S. for the same
3. If the applicant is an owner who is not the original owner, both the	original owner and the applicant must me	et one of the above criteria.
The original breeder/owner may be the individual or company who did Act for definitions.	rected the final breeding. See Section 41	(a)(2) of the Plant Variety Protection
According to the Peperwork Reduction Act of 1995, an agency may not conduct or sponsor, control number. The velid OMB control number for this information collection is 0591-0055, response, including the time for reviewing the instructions, searching existing date sources,	The time required to complete this information collect	ion is estimated to average 0.1 hour per
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and a status, familial status, parental status, religion, sexual orientation, genetic information, politic assistance program (Not all prohibited bases apply to all programs.) Persons this disabilities audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD.	el beliefs, reprisal, or because all or part of an individu s who require alternative means for communication of p	al's income is derived from any public

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY PLANT VARIETY PROTECTION OFFICE BELTSVILLE, MD 20705

EXHIBIT F DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country)	TEMPORARY OR EXPERIMENTAL DESIGNATION	
Pioneer Hi-Bred International, Inc.			
	P. O. Box 1014 Johnston, Iowa 50131-1014 USA	PH18KW	
NAME OF OWNER REPRESENTATIVE(S)	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country)	FOR OFFICIAL USE ONLY	
Bradford D. Hall	Pioneer Hi-Bred International, Inc. 7301 NW 62nd Avenue PO Box 85 Johnston, Iowa 50131-0085 USA	PVPO NUMBER	

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Signature